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## RESEARCH ARTICLE

# NON SURGICAL PERIODONTAL THERAPY-A LITERATURE REVIEW

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**ABSTRACT**

An increasing number of patients have become aware of the detrimental effects of periodontal disease and tooth-loss and they seek periodontal care. The cornerstone of management of chronic periodontitis is the non-surgical periodontal treatment. The primary goal of periodontal therapy is to preserve the natural dentition by achieving and maintaining a healthy functional periodontium. Many adjunctive treatment modalities have been introduced lately to enhance the therapeutic outcome of periodontal treatment. It appears that there is no periodontal therapy where nonsurgical periodontal therapy is no longer effective. Some of these modalities have been found to offer statistical significant benefit in clinical outcomes than the scaling and root planning alone.

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## INTRODUCTION

Dental plaque is the main etiologic factor in the pathogenesis of periodontal diseases. Several other aspects including genetic, host and environmental factors modulate the course of periodontal infections Advances in research have also led to the development of equipment and modifications in treatment protocols. However, the basic approach to periodontal infections has always been and remains the removal of supra- and subgingival bacterial deposits by scaling and root planning. Nonsurgical mechanical periodontal treatment is the cornerstone of periodontal therapy and the first recommended approach to the control of periodontal infections. Many clinical studies conducted in the past few decades have confirmed the effectiveness of the nonsurgical approach in treating periodontal infections.

***Effect of non- surgical therapy on furcation sites:*** It has been shown that moderately deep and deep molar furcation sites respond less favorably to nonsurgical therapy than do non-molar sites and molar. Flat surface sites of similar probing depth. Leon & Vogel[1] showed that in severely involved furcation's, ultrasonic instrumentation succeeded in decreasing the counts of spirochetes and motile rods. Drisko [2] commented that power-driven instrumentation using newly designed micro-ultrasonic tips may be more effective for debridement of furcation areas.

### *Effect of surgical therapy on periodontal parameters*

***Changes in gingival inflammation:*** Nonsurgical periodontal therapy leads to a reduction of the periodontal inflammation as evidenced by a reduction in bleeding tendency[3]. This reduction in inflammation in the periodontal tissues could not be obtained by supragingival plaque control alone. Although the development of supragingival plaque control led to some reduction of the periodontal inflammation, the majority of the reduction in inflammation was only obtained following the subgingival instrumentation.

***Changes in probing pocket depth and clinical attachment level:*** During the weeks following subgingival debridement and mechanical instrumentation of the root surfaces combined with an appropriate home care program aiming at adequate supragingival plaque control, a reduction in probing pocket depth is observed. This probing pocket depth reduction is beneficial since it results in an environment that is less favorable for the establishment of anaerobic periodontopathic microorganisms. Moreover, the reduced values for probing pocket depth also facilitate the access for later debridement and polishing during the maintenance phase of the supportive periodontal care and for plaque removal during self-performed oral hygiene.The reduction in probing pocket depth is the result of both a gain in clinical attachment level and a recession of the marginal gingival tissues.

The gingival recession results from the reduction in swelling of the marginal gingival tissue.

***Changes in alveolar bone structures:*** While most studies on nonsurgical periodontal therapy have addressed the clinical changes occurring in the soft tissue compartment of the periodontium, such as the degree of inflammation, the amount of probing pocket depth reduction and the changes in clinical attachment levels[4], only few studies have also followed the changes occurring in the osseous compartment of the periodontium.

***Scaling and root planning:*** Subgingival plaque in biofilm can evade the defense mechanisms of the host and diminish the effect of chemotherapeutic agents.[5] Biofilms cannot be eliminated by daily oral hygiene methods. Thus, mechanical debridement, including scaling and root planning, is required for successful periodontal treatment. Subgingival scaling can cause reduction in spirochete and motile rod counts with a concomitant increase in coccoid cells. Haffajee et al.[6] examined the levels of 40 bacterial species including A. actinomycetemcomitans, P. gingivalis, Prevotella intermedia and Treponemadenticola using checkerboard DNA–DNA hybridization before and after scaling and root planning in 57 adult periodontitis patients. After scaling and root planning, a mean gain in attachment level and a reduction in gingival redness, bleeding on probing, and mean pocket depth were observed[7]

***Lasers:*** The commonly used high power lasers CO2 and Nd: YAG are capable of excellent soft tissue ablation, and have an adequate hemostatic effect. As such, these lasers have been generally approved for soft tissue management in periodontics and oral surgery. However, these lasers are not useful for treatment of the root surface or alveolar bone, due to carbonization of these tissues and major thermal side-effects on the target and surrounding tissues (159). Until the beginning of the 1990s, the use of laser systems in periodontal therapy was limited to soft tissue procedures, such as gingivectomy and frenectomy. Later, in the mid-1990s, Aoki et al.[8] and Keller et al. began to investigate the application of the Er: YAG laser for periodontal hard tissue procedures, such as dental calculus removal and decontamination of the diseased root surface.

***Systemic administration of antibiotics***

***Rationale:*** Ideally, the causative microorganisms should be identified and most effective agent selected using antibiotic-sensitivity tests. An ideal antibiotic for use and prevention and treatment of periodontal diseases should be specific for periodontal pathogens, allogenic and nontoxic, substantive, not in general use for treatment of other diseases and inexpensive. Ideal antibiotic for periodontal pathogens does not exist. Although oral bacteria are susceptible to many antibiotics, no single antibiotic concentration achieved in body fluids inhibit all periodontal bacteria[9]

***Local delivery of antibiotics:*** The concept that local delivery of an antibiotic into the periodontal pocket achieves a greater, more potent concentration of drug than available with systemic delivery is very appealing. The amount of drug delivered often creates sulcular medication concentrations exceeding the equivalent of 1 mg ⁄ml (1,000 lg ⁄ml).Microbiologically, the concept of treating only those sites that are deemed to be in need of treatment by mechanically removing subgingival plaque, then subsequently applying a locally delivered antimicrobial, appears ideal. In theory, mechanical debridement serves to disrupt and displace the biofilm. Locally administered antibiotics, at concentrations much greater than can be achieved systemically, aid in site-specific elimination of residual bacteria e.g. of locally administered drugs are Tetracycline, Subgingival doxycycline Subgingival minocycline, Subgingival metronidazole, Chlorhexidine

***Host modulation therapy:*** Host modulation therapy is a treatment concept that aims to reduce tissue destruction and stabilize or regenerate the periodontium by modifying or down regulating destructive aspects of the host response and upregulating protective or regenerative responses.HMT are systemically or locally delivered pharmaceuticals that are prescribed and are used as adjuncts to conventional therapy. HMT offer the potential for down regulating destructive aspects and upregulating protective aspects of the host response so that, in combination with conventional treatments to reduce bacterial burden, the balance between health and disease progression is tipped in the direction of a healing response.

***Full mouth disinfection:*** Mombelli et al 1995[10] applied a full-mouth periodontal treatment protocol, by applying tetracycline fibers in all periodontal pockets of depths of 3 mm and above, rather than only in the deepest sites in this group, all teeth were supragingivally scaled prior to tetracycline fiber placement and the subjects were instructed to use 0.2% chlorhexidine rinse. In the locally treated group, only the deepest pockets were treated by the application of tetracycline fibers, without further treatment to other pockets and no chlorhexidine rinse was used. Quirynen et al 1995[11]found that periodontal treatment could not eliminate the pathogens from the oral mucosa. They pointed out that if periodontal treatment does not result in elimination of pathogens from the mucous membranes, these surfaces may function as the following:

- A source of reinfection for the healing and healthy periodontium after treatment;
- A source of transmission to family members;
- Or even a reservoir for infection of tissues around implants.

***Supportive periodontal therapy:*** Supportive periodontal therapy, formerly referred to as periodontal maintenance, should include an update of the medical and dental histories, examination of extra- and intraoral soft tissues, dental examination, radiographic review, evaluation of the patient's oral hygiene performance, periodontal evaluation and risk assessment, with supra- and subgingival removal of bacterial plaque and calculus, and retreatment of disease when so indicated. The therapeutic goals of SPT are to:1)prevent or minimize the recurrence and progression of periodontal disease in patients who have been previously treated for gingivitis, periodontitis, and peri-implantitis. 2)prevent or reduce the incidence of tooth loss by monitoring the dentition and any prosthetic replacement of natural teeth.3)increase the probability of locating and treating in a timely manner, other diseases or conditions found within the oral cavity.

**Conclusion**

Plaque is the primary etiological factor for gingivitis and periodontitis.

So far no home care products or devices currently available can completely control or eliminate the pathogenic plaques associated with periodontal diseases for extended periods of time. Daily home care and frequent recall are still paramount for long-term success. Nonsurgical therapy remains the cornerstone of periodontal treatment.

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